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FARROKH, HASHEM

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2187	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/679,798	**Applicant(s)** COPPOCK ET AL.	
	Examiner Hashem Farrokh	**Art Unit** 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-2,4-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on *06 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *10/6/03*.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The instant application having application No. 10/679,798 has a total of 19 claims pending in the application; claims 1 and 18 have been amended; claim 3 has been canceled; no claim has been added.

INFORMATION CONCERNING CLAIMS:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

Claims 1-2 and 4-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0101711 A1 to Gold in view of U.S. Patent No. 6,834326 B1 to Wang et al. (hereinafter Wang).

1. In regard to claim 1, Gold teaches:

"A method for reporting volume information on one or more redundant arrays of independent disks (RAID) **(elements 302-313 in Fig. 3)** in an information handling system having one or more storage device drives," **(e.g., see paragraph 98 in page 6; Fig. 10)**.

"the method comprising:"

"identifying one or more software RAID volumes on the information handling system;" **(e.g., see paragraph 64 in page 3; Fig. 4)**. *Figure 4 show that the storage device 204 consists of RAID 1 volume comprising 2 disks and RAID 5 volume comprising 10 disks.*

"identifying the storage device drives coupled to the information handling system;" **(e.g., see element 204 in Fig. 2).** *Storage device 204 is one of the components of the computer system or the information handling system.*

"correlating the RAID volumes to the storage device drives;" **(e.g., see paragraph 64 in page 3; Fig. 4)**. *Fig. 4 shows that the storage device 204 (shown in Fig. 1) consists of RAID 1 and RAID 5 volumes. RAID 1 correlated to disk1 and disk 2 and RAID 5 correlated to disk3 – disk12.*

"determining an initial worst case operational state between the identified RAID volumes and the identified storage device drives;" **(e.g., see paragraphs 89-95 in pages 5-6; paragraph 105 in pages 6-7; Fig. 15)**. *For example a disk failure in RAID 5 volume represents an initial worst operational state.*

"reporting the initial worst case operational state to a light emitting diode (LED) driver **(e.g., see paragraph 105 in pages 6-7)**, the LED driver operable to operate a chassis LED in accordance with a last reported worst case operational state;" **(e.g., see paragraph 105 in pages 6-7).** *For example the RAID management service includes LED driver capable of setting and clearing one or more LEDs on the disk storage devices (e.g., chassis). The RAID management service (e.g., LED drive) operable to operate the LED previously detected worst-case condition (e.g., a disk failure).*

"determining a current worst case operational state between the RAID volumes and the storage device drives;" **(e.g., see paragraph 105 in pages 6-7; Fig. 15).** *For example a current worst-case operational condition a multiple disk storage devices failure and loss of data.*

"reporting the current worst case operational state to the LED driver." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).** *Gold discloses that when there are multiple disks failure and loss of data, a message is generated to alert (e.g., to report) this condition. The process includes setting the LEDs in the disk storage devices by the RAID management service. However, Gold does not expressly teaches:* "...software RAID..."

Wang teaches: "...software RAID..." **(e.g., see column 21, lines 57-58)** *for implementing RAID purely in software.*

Disclosures by Gold and Wang are analogous because both references related to RAID Storage systems.

At the time of invention it would have been obvious to a person of ordinary skill in art to modify the RAID system taught by Gold to include the software RAID disclosed by Wang.

The motivation for using software RAID as taught by column 21, lines 63-67 to column 22 of Gold because software RAID has advantage of being more flexible as compared to hardware RAID; another advantage of using software RAID is the cost.

Therefore, it would have been obvious to combine disclosures by Wang with Gold to obtain the invention as specified in the claim.

2. In regard to claim 2, Gold teaches:

"determining, prior to operating the chassis LED in accordance with a reported worst case operational state (**paragraph 105 in pages 6-7**), whether the current worst case operational state is different than the last reported worst case operational state;" **(e.g., see paragraph 105 in pages 6-7; Fig. 15).** *For example detecting or determining that the current RAID volume failure involves the current multiple disk storage device failure and then operating setting the LEDs on the storage device to alert the failure conditions.*

"and reporting the current worst case operational state to the LED driver in response to a difference between the current worst case operational state and the last reported worst case operational state." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).** *For example when a multiple disk devices failure involving RAID 5 volume detected that is different from the previous individual disk failure, the previous message cleared and a message reported including setting the corresponding LEDs on the failed storage devices.*

3. In regard to claim 4, Gold teaches:

"identifying one or more network attached storage appliances." **(e.g., see paragraph 51 in page 2).**

4. *In regard to claim 5, Gold teaches:* "An information handling system, **(e.g., see paragraph 51 in page 2; paragraph 52 in page 3; Figs. 1-2)**. *All of the components of computer 100 (Fig. 1) shown in Fig. 2 are functionally coupled with the processor and one-another and represents the information handling system recited in the claim.*

"comprising:"

"a processor;" **(e.g., see element 202 in Fig. 2).**

"a memory operably coupled to the processor;" **(e.g., see element 203 in Fig. 2).**

"an information storage device operably coupled to the processor and the memory;" **(e.g., see element 204 in Fig. 2).**

"at least one light emitting diode (LED) operably coupled to the information storage device;" **(e.g., see paragraph 104 in page 6).**

"and a program of instructions storable in the memory and executable by the processor **(e.g., see paragraph 24 in page 1; claim 7 in page 7)**, the program of instructions operable to obtain an operational state for one or more software-based RAID (redundant array of independent disks) volumes on the information storage device and command operation of the LED in a manner reflective of the software-based RAID volume operational state." **(e.g., see paragraph 91 in pages 5-6; paragraph 105 in pages 6-7; Fig. 15).** *For example Fig. 15 shows the program steps (e.g., instructions) to detect or obtain the operational state (e.g., a volume failure). In case of failure, one or* *more LEDs are set to enable easy identification of disks which caused the failure. However, Gold does not expressly teach:* "...software RAID..."

Wang teaches: "...software RAID..." **(e.g., see column 21, lines 57-58)** *for implementing RAID purely in software. The motivation for combining is based on the same rational given in the rejection of claim 1.*

5. In regard to claim 6, Gold teaches:

"the program of instructions operable to communicate with a logical volume manager to determine the operating state of the one or more information handling system software-based RAID volumes" **(e.g., see paragraphs 104-105 in pages 6-7; Figs. 14-15).**

6. In regard to claim 7, Gold teaches:

"the program of instructions operable to communicate with an information handling system operating system to identify the information storage devices coupled to the information handling system." **(e.g., see paragraph 63 in pages 3; paragraph 97 in pages 6; Figs. 4 and 9).**

7. In regard to claim 8, Gold teaches:

"the program of instructions operable to determine an operational state for the one or more information storage devices." **(e.g., see paragraphs 104-105 in pages 6-7; Figs. 14-15).**

8. In regard to claim 9, Gold teaches:

"the program of instructions operable to correlate the one or more software-based RAID volumes to the one or more information storage devices" **(e.g., see paragraph 63 in pages 3; paragraph 97 in pages 6; Figs. 4 and 9).**

9. In regard to claim 10, Gold teaches:

"the program of instructions operable to identify a least preferred operational state from the operational state of the one or more software-based RAID volumes and the one or more information storage devices." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).** *A least preferable state is when there are multiple storage device or disks failure, since it would cause loss of data.*

10. In regard to claim 11, Gold teaches:

"the program of instructions operable to operate the LED in accordance with the least preferred operational state." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).**

11. In regard to claim 12, Gold teaches:

"the program of instructions operable to: periodically poll the operational state of the software-based RAID volumes and the information storage devices;" **(e.g., see paragraph 107 in page 7).** *For example Gold teaches an automatic ongoing poll that represents the periodic poll recited in the claim.*

"determine a new least preferred operational state between the software-based RAID volume operational state and the information storage device operational state;" **(e.g., see paragraph 105 in pages 6-7; Fig. 15).**

"determine whether the new least preferred operational state is different from a previously identified least preferred operational state;" **(e.g., see paragraphs 104-105 in pages 6-7; Figs. 14-15).** *For example the new* least preferred operational state include multiple disks failure (e.g., in RAID 5 volume)

"and alter operation of the LED in response to a difference between the new least preferred operational state and the previously identified operational state." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).** *For example the previous single disk failure message is cleared and a new message generated and LEDs associated with the faulty are being set.*

12. *In regard to claim 13, Gold teaches:*

"A computer readable medium comprising a program of instructions," **(e.g., see paragraph 24).** *For example management module stored as management program stored RAID 1 (e.g., computer readable medium) includes program instructions.*

"the program of instructions operable to:"

"determine an operating status of at least one software redundant array of independent disks (RAID) volume on an information handling system;" **(e.g., see paragraph 105 in page 6-7; Fig. 15).**

"and operate at least one user observable light emitting diode (LED) in a manner indicative of the software RAID volume operating status." **(e.g., see paragraph 105 in page 6-7; Fig. 15).** *However, Gold does not expressly teach:* "...software RAID..."

Wang teaches: "...software RAID..." **(e.g., see column 21, lines 57-58)** *for implementing RAID purely in software. The motivation for combining is based on the same rational given in the rejection of claim 1.*

13. In regard to claim 14, Gold teaches:

"the program of instructions operable to determine a last operating status and a current operating status of the at least one software RAID volume." **(e.g., see paragraph 104 in page 6; Fig. 15).**

14. In regard to claim 15, Gold teaches:

"the program of instructions operable to alter operation of the at least one user observable LED in response to a difference between the current operating status and the last operating status of the at least one software RAID volume." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).**

15. In regard to claim 16, Gold teaches:

"the program of instructions operable to query an information handling system volume manager to identify the at least one software RAID volume on the information handling system." **(e.g., see paragraph 97 in page 6; Fig. 9).**

16. In regard to claim 17, Gold teaches:

"the program of instructions operable to: query an information handling system operating system to identify at least one storage device coupled to the information handling system;" **(e.g., see paragraph 63 in pages 3; paragraph 97 in pages 6; Figs. 4 and 9).**

"and determine an operating status for the at least one storage device." **(e.g., see paragraphs 104-105 in pages 6-7; Figs. 14-15).**

17. In regard to claim 18, Gold teaches:

"the program of instructions operable to: identify a worst case operating status between the at least one software RAID volume and the at least one storage device;" **(e.g., see paragraph 105 in pages 6-7; Fig. 15).**

"and operate the at least one user observable LED in accordance with the worst case operating status." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).**

18. In regard to claim 19, Gold teaches:

"the program of instructions operable to establish a correlation between the at least one software RAID volume and the at least one storage device." **(e.g., see paragraph 63 in pages 3; paragraph 97 in pages 6; Figs. 4 and 9).**

19. In regard to claim 20, Gold teaches:

"the program of instructions operable to communicate the operating status of the at least one software RAID volume to an LED driver, the LED driver operable to command operation of the at least one user observable LED." **(e.g., see paragraph 105 in pages 6-7; Fig. 15).**

Response to Remarks

In view of amendment of claim 18 the rejection under 35 USC § 112 second paragraph is withdrawn in this Office Action. The Applicant has amended the independent claim 1 to indicate "software RAID". *In his Remarks the Applicant argues that disclosure by Gold is* "headless computer entity" *and quotes several various paragraphs from Gold disclosure to indicate that the* "headless computer entity" *taught by Gold is intended to be self-managing and self-maintaining (page 7-8 of Applicant's Remarks). However, there is not any indication in the language of claims that indicate the system cannot be self-managed or self-maintained. In addition contrary to the Applicant assertion the paragraphs 53 and 58 of Gold do not state that the* "headless computer entity" *is a hardware (or software) RAID system. However, as shown above in rejection of claims, additional prior art reference is used to overcome the Applicant Objection.*

Conclusion

The prior art made of record and not relied upon are as follows:

1. U. S. Patent Publication No. 2003/0070043 A1 to Merkey describes High speed fault tolerant storage systems.

2. U. S. Patent No. 5,367,669 to Holland et al. describes Fault tolerant hard disk array controller.

3. U. S. Patent Publication No. 5,835,700 to Carbonneau et al. describes SCSI-coupled module for monitoring and controlling SCSI-coupled raid bank and bank environment.

Any inquiry concerning this communication should be directed to Hashem Farrokh whose telephone number is (571) 272-4193. The examiner can normally be reached Monday-Friday from ***8:00 AM to 5:00 PM.***

If attempt to reach the above noted Examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Donald A Sparks, can be reached on (571) 272-4201. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBS) at 866-217-9197 (toll-free).

HF

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2006-05-28

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